An Overview of Labour Market & Skills Shortage Issues in British Columbia and Canada

Youth and Labour Market Services Branch
Ministry of Advanced Education
June 2001

BRITISH COLUMBIA

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Presentation Overview . . .

- Context, Differences in Opinions Over Scope & Magnitude of the Issue
- Defining, Causes and Measures of Labour Market and Skills Shortages
- Economic Indicators
- Recent Reports and Employer Based Surveys
- Current vs. Future LM and Skills Shortages
- Particular Occupational Areas of Concern
- Demographic, Employment Projections and Other Information for Understanding the Future
- Economic Impacts of Skilled Labour Shortages
- Implications for the Employers
- Public Policy Challenges

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Context . . .

- In the knowledge-based economy, human capital is "the" critical success factor for employers and workers
- Knowledge and skills are key to positioning the economy in the global marketplace
- Post-secondary education and training is a key economic policy tool to ensure sufficiently skilled labour supply

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Context (cont'd) . . .

- Increasing concern among employers about shortages of qualified workers
- BC is better off than some other jurisdictions:
  - We have larger 5-12 and 13-19 age cohorts
  - Traditional net in-migration from Canada and the world
- Biggest problem relates to high-skill occupations, not labour as a whole
- Demographic and economic factors are both playing a role

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Context (cont'd) . . .

- Concern over existing or anticipated shortages of appropriately qualified labour is not new
- Recent concerns raised in 1999 and 2000. (considerable reports and concerns expressed in late-1980's, then disappeared until late-1990's)
- Labour shortages are a common phenomenon in modern, dynamic economies. Shortages are not necessarily indicative of any inherent malfunction in the labour market or in education/training systems

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Differences in opinion over scope & magnitude of the skills shortages issue . . .

- Some view the issue as a current and future general shortage of skilled labour, a few also view as a future larger overall labour shortage (skilled and unskilled)
- Most feel the issue is confined to particular occupational shortages, in highly skilled areas
- In some cases occupational shortages are regional in scope, others are province or Canada wide (Eg. Registered Nurses)

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Concepts and definitions . . .

- Labour market shortages
  - ⇨ Demand for workers exceeds the supply of workers willing to work at existing market conditions (e.g., at a given wage or in a given geographical location)."
- Skills shortages
  - ⇨ Lack of adequately skilled individuals at current levels of remuneration, conditions of employment or geographic location
- Skill gaps
  - ⇨ Existing employees lack required skills and experience to meet a firms skill needs
- Recruitment/retention difficulties
  - ⇨ There may be an adequate supply of skilled workers but employers are unable to recruit or retain sufficient employees at existing market conditions

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Skills or labour shortages occur from a change in labour market conditions due to ...

- Cyclical economic factors
  - ⇨ Such as overall economic activity, particular economic sector upturn or downturn, commodity price changes
- Structural factors
  - ⇨ Such as an aging population, changes in consumer tastes for products and services, technological innovations, or institutional changes such as wage contracts, union or labour market regulations, and government programs

- *Structural factors tend to result in skilled worker shortages in particular occupations, sectors or regions, and are more likely to require government and industry responses. Shortages at the peak of an economic cycle tend to resolve themselves over time*

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Types of labour market/skills shortages ...

- Aggregate vs. specific labour market/skill shortages
  - Aggregate shortage refers to generalized or widespread worker shortages in the overall economy or particular broad occupational grouping
  - Specific shortage refers to shortages in a specific occupation, skill or geographic area
- Cyclical vs. structural labour market/skill shortages
  - Cyclical shortages occur with economic cycles characterized by under/over utilization of available labour
  - Structural shortages result in restructuring of the workforce which impacts the production structure of the economy resulting in different composition of labour demand and supply (eg. tech change or changed ratio of labour market entrants/exiters due to baby boom retirement wave)

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Measuring labour market/skills shortages ...

Two key detection or measurement approaches:

- Economic or market indicators
  - Such as employment growth, unemployment rates, wage growth, new hires and vacancy rates for particular occupations. This provides indicators from which statements of market imbalances are inferred. Can also include comparisons of employment outcomes of recent graduates and follow-up with graduates by field of study
- Employer-based surveys or interviews
  - Gather information from individual employers on recruitment and retention of workers in given occupational groups or with specific skills

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Economic indicators approach ...

- In a competitive environment (non-regulated market) labour market/skills shortages will be translated into upward movements/pressures on wages and employment growth, and downward pressure on unemployment rates
- Advantages
  - ⇨ Objective measure, easy to interpret, possible to do consistent time series analysis
- Disadvantages
  - ⇨ Inadequate for non-competitive (regulated) labour markets (eg. nurses)
  - ⇨ Constrained by data availability (aggregation, skill, job vacancies) and also cannot reflect sub-occupations where imbalances do exist

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Employer based surveys approach ...

- A high degree of recruitment/retention difficulty is associated with existence of potential shortages
- Advantages
  - ⇨ Allows for identification of shortage in non competitive (regulated) labour market
  - ⇨ Collect direct employer/industry based information
  - ⇨ Provides information on skills and experience requirements
- Disadvantages
  - ⇨ Subjective, and also often ad-hoc. So time series analysis is often not possible
  - ⇨ Difficulty in interpreting results, for instance real shortages vs. inadequate working conditions, wages, environment

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Economic indicators approach – example ...

- At an aggregate level, economic indicators do not show a current widespread labour market shortage, but do show some tightening
- Evidence of structural occupational skill shortages appears in information technology, engineering, health, and some management occupations, both in B.C. and nationally
- Evidence of cyclical occupational skill shortages appears nationally in some occupations in construction, manufacturing, transportation and services

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Economic indicators approach – example ...

Potential Structural Occupational Skills Shortages - Canada

	Average 2000-2001		
	Employment Growth	Wage Growth	Unempl. Rate
Computer Systems Analysts	16.2%	11.6%	2.5%
Information Systems Managers	10.3%	9.8%	2.2%
Computer Engineers	58.9%	9.9%	2.2%
Pharmacists	37.7%	8.4%	0.3%
Nurses and LPNs	3.9%	10.7%	1.4%
Teachers	8.8%	9.0%	3.6%
College Instructors (Public & Private)	2.6%	5.7%	3.9%
All Occupations- All Sectors Average	2.7%	4.7%	4.6%

Source: Labour Force Survey, HRDC Applied Research Branch, preliminary work

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Employer based surveys approach ...

- Most employer based survey results appear in a variety of reports by business, industry, sector, or multi-partite bodies examining the issue
- A number of these of are briefly reviewed below
- Timing of these surveys must be accounted for to help distinguish cyclical shortages from structural shortages
- For example, most of the surveys and studies were taken at the peak of the IT and computer sector explosion and rapid expansion (in 1999 and 2000)
- In the case of IT, the recent downturn in IT (Spring 2001) appears largely cyclical. Structurally there remains a human resource challenge over the next 10 years for computer and IT professionals

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Recent reports - CFIB ...

- The Canadian Federation of Independent Business in February 2001 released a report, which concludes there is a widespread general shortage of skilled workers, and it is not occupation or sector specific
- Nearly half of Canadian CFIB employers (35 per cent in BC) expressed concerns over shortage of qualified labour when surveyed in the second half of 2000
- Note however that almost half of the CFIB employer respondents cited high wage expectations of workers as a reason for hiring difficulties

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Recent reports - Conference Board of Canada ...

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- CBOC in 1999 surveyed 500 medium sized Canadian companies, and prepared a study on the management of scarce skills in response to members' difficulties in recruiting and retaining workers with necessary skills
- Main findings
  - Skills shortages a threat to competitiveness
  - 83% reported shortages of skilled workers
  - 63% expected shortages to get worse
  - 95% had shortages for experienced workers
  - Only 21% had shortages for entry level technical jobs – including IT workers, engineers, technicians

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Recent reports - Expert Panel on Skills and Business Council of BC ...

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- Expert Panel on Skills' January 2001 report finds that there exist shortages of technically skilled workers in some niche areas (information technology, aerospace, and health), and a potential for future shortages of skilled trades workers due to retirements in the next ten years
- Business Council of BC's biennial skills survey report, released November 29, 2000, finds that medium and large employers only "sometimes" have difficulty finding well qualified applicants for professional and technical workers, but "often" have difficulty finding managerial staff
- Both reports emphasize the importance of soft skills (communications, writing, teamwork). Neither conclude there exists a widespread shortage of workers with technical skills

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Future labour market/skills shortages versus current situation ...

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- Both the economic indicators and employer based survey approaches capture and illustrate recent and current conditions, but they only indirectly infer the future situation
- Future labour market and skills shortages issues are difficult to forecast, owing to both future demand and supply events, and how they will interact, further changing the situation
- Assessing future labour market and skills shortages requires also using other available indicators, projections and facts

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Future labour market/skills shortages versus current situation (cont'd) ...

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- Use of economic indicator and employer based survey evidence together with data and analysis concerning demographics, employment projections, evolving occupational skill requirements, new technology and changing employer work organization practices supports development of future views
- Based on this information future structural specific skilled occupational shortage will be of most concern for the following skilled occupations
- In large part these are North American-wide challenges, and not specific to BC alone

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Future skilled labour shortages including particular areas of concern for BC ...

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- Health care – physicians, nurses, pharmacists, other professionals
  - ⇨ Reflects impending retirement replacement challenge, as well as Canada/North American shortages
- University/college faculty
  - ⇨ Up to 40% of current BC faculty will need to be replaced by 2010. Similar situation across North America
- IT workers and engineers
  - ⇨ Structurally demand outstrips supply across North America. The recent cyclical upturn in 99-00 and cyclical downturn in 01 is unlikely to impact longer term structural requirements for such professionals
- Selected construction and industrial trades
  - ⇨ lack of new entry level/ trainee hires by employers, disinterest by young persons

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High opportunity occupation groups in BC, 1998 to 2008 ...

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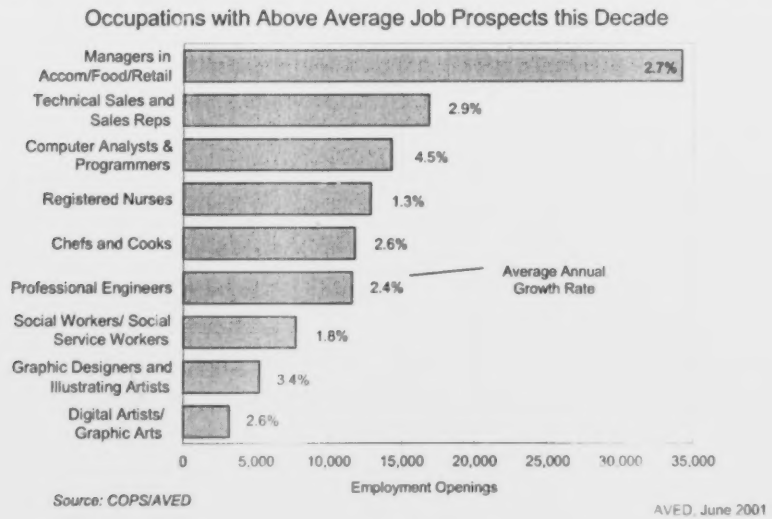

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Future skilled labour shortages including particular areas of concern for BC ...

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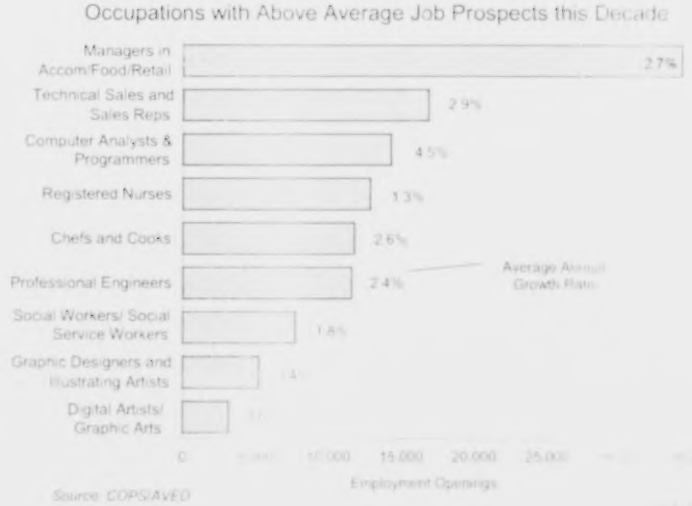

Additional information relating to labour market and skills shortage issues ...

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- Representatives of the Business Council of BC and others have pointed out skills shortages will be a continuing future issue, because:
- Demographic and labour force trends present a much different future situation than in the past
- Growing knowledge and skill-intensity of employment, and changes in skills requirements within existing occupations
- North American and global competition for well-educated and highly-skilled "human capital"

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B.C. population of men and women by age groups, 1976, 2000 and 2026 ...

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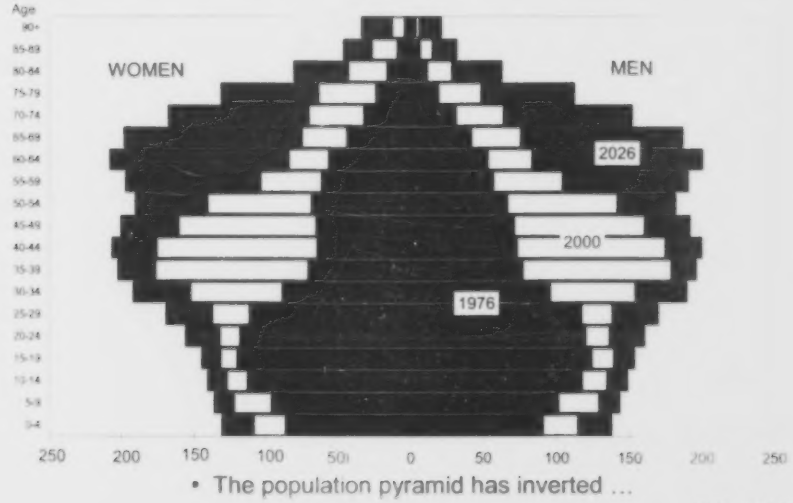

- The population pyramid has inverted ...

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The baby echo population is much smaller than the baby boom population ...

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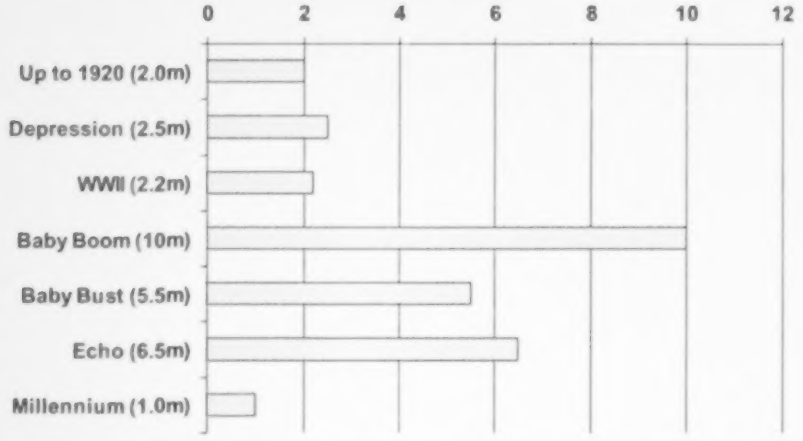

- Number of Canadians in each generation (millions) ...

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Population growth in BC by age group from 1998 to 2008 . . .

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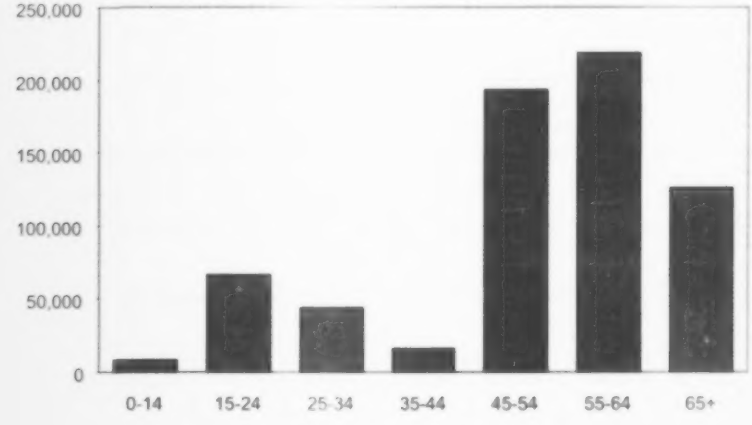

- The baby boom population is greying ...

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BC job entry population compared to pre-retirement population . . .

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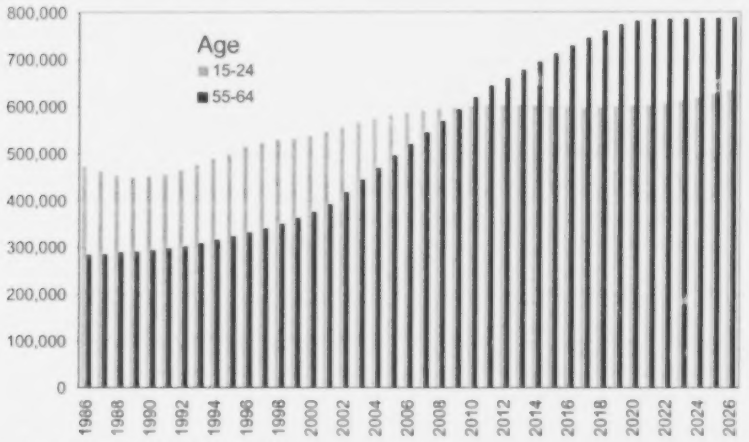

Source: BC Stats, P.E.O.P.L.E. 25, June 2000

- Those soon leaving the labour force will begin to exceed those entering ...

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BC post-secondary aged population is growing and K-12 is flat at present ...

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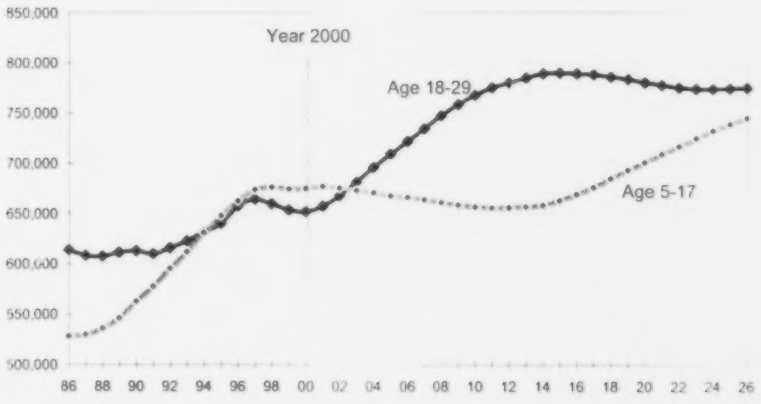

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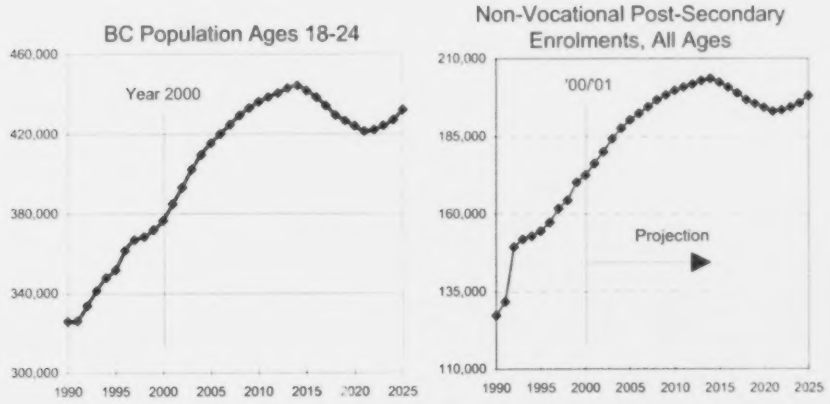
The number of post-secondary students will have to increase to maintain current participation rates ...



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BC employment grew fastest for those with the most education in the 90's ...

B.C. Employment Levels and % Change, Ages 25-54

	Employment in 000's			% Change	
	1991	1995	1999	91-95	95-99
Total	1,149.7	1,337.9	1,427.1	16.4%	6.7%
Some high school or less	162.4	158.8	148.2	-2.2%	-6.7%
High school graduate	307.2	336.1	327.0	9.4%	-2.7%
Some post-secondary	141.5	124.3	135.0	-12.2%	8.6%
Post-secondary certificate or diploma	354.6	456.0	503.1	28.6%	10.3%
University degree	184.0	262.6	313.8	42.7%	19.5%

Source: LFS, Statistics Canada

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Labour market conditions in 90's favoured those with post-secondary credentials ...

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B.C. Employment Distribution, Employment to Population Ratio and Unemployment Rates, Ages 25-54

	Distribution of Employment		Employment to Population Ratio		Unemployment Rate
	1991	1999	1991	1999	1999
Total	100%	100%	77.7%	77.9%	7.4%
Some high school or less	14%	10%	64.1%	60.5%	14.1%
High school graduate	27%	23%	75.9%	75.3%	8.6%
Some post-secondary	12%	9%	79.4%	76.0%	7.3%
Post-secondary certificate or diploma	31%	35%	83.4%	83.0%	5.9%
University degree	16%	22%	84.2%	85.2%	5.1%

Source: LFS, Statistics Canada

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Earnings gaps between more and less educated have widened ...

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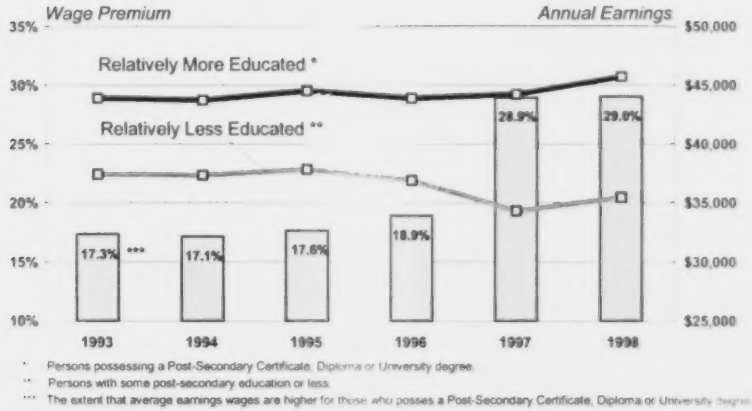

* Persons possessing a Post-Secondary Certificate, Diploma or University degree.

** Persons with some post-secondary education or less.

*** The extent that average earnings wages are higher for those who posses a Post-Secondary Certificate, Diploma or University degree.

- Greater upward pressure on earnings for more educated workers indicates that demand for educated workers increased faster than supply in the 1990's.

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The "New Economy" is for real. A small number of sectors account for 1/3 of job growth ...

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BC Employment Change in Selected Subsectors, 1989-1999

Selected Sub-Sector	Employment Level 1999	% Change 1989-1999	Net Change 1989-1999
Computer System Design Services	27,700	280%	20,400
Management, Scientific and Technical Services	22,700	137%	13,100
Electronics, Computer and Appliance Stores	11,000	72%	4,600
Computer and Electronic Product Manufacturing	7,800	48%	2,500
Architectural, Engineering and Design Services	30,800	23%	5,800
Travelling Services	8,100	179%	5,200
Scenic & Sightseeing Transp. & Support Activities	18,500	73%	7,800
Air Transportation	19,900	58%	7,300
Motion Picture and Sound Recording Industries	10,800	184%	7,000
Performing Arts, Spectator Sports & Related	19,500	108%	10,100
Building Services	30,600	91%	14,600
Business Support & Manag. of Enterprises Serv.	10,300	51%	3,500
Securities & Invest. Advice and Portfolio Manag.	15,500	121%	8,500
Accounting and Tax Services	21,600	55%	7,700
Other Schools and Educational Support	17,700	190%	11,600
Above Sub-Sectors as Proportion of All Employment	14%		33%

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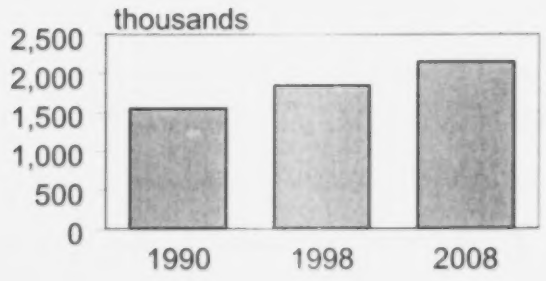
Employment will continue to grow in BC ...



- Employment will reach 2.140 million by 2008

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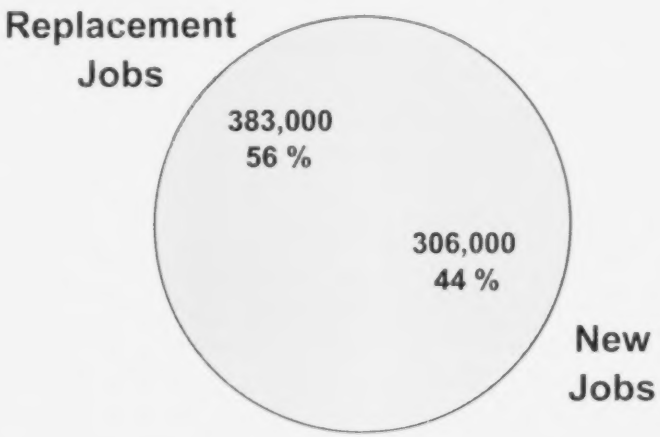
Most employment openings will be to replace workers retiring to 2008 . . .



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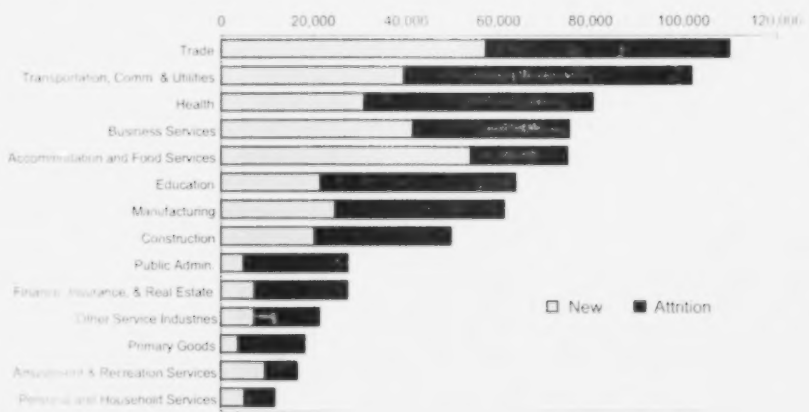
BC industry employment projections - number of total openings 1998-2008 ...



- Transportation, Education, Manufacturing and Health Sectors will see nearly two-thirds of job openings from replacement needs for those retiring, much higher than the 56% for all sectors.

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Most employment openings will be to replace workers retiring to 2008 . . .

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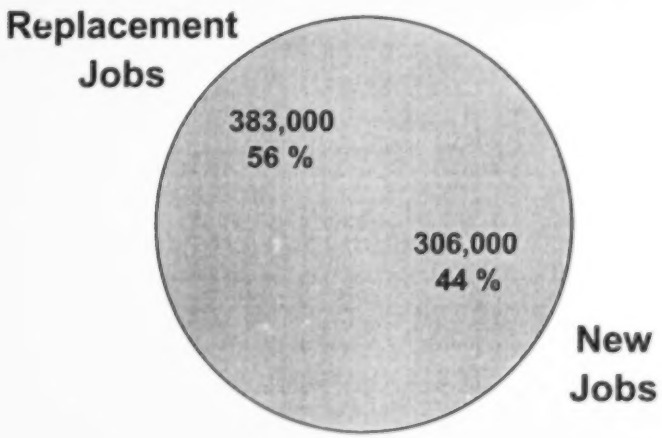

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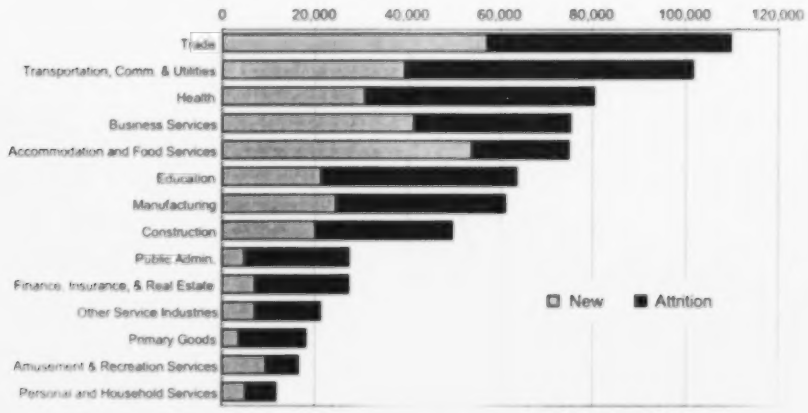

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Age structure for selected professions and trades occupations in BC ... [37]

NOC #	Occupational Group Title	Employment	Avg. Age	% Age 45+	% Age 40+
All Occupational Groups		1,790,130	38	32.1%	45.9%
Professions					
2162	Computer Systems Analysts	8,370	37	19.1%	35.7%
2163	Computer Programmers	6,395	34	14.5%	27.2%
3152	Registered Nurses	28,915	42	41.7%	60.5%
4142	Elementary School Teachers	27,440	42	44.4%	61.9%
Electricial					
2244	Aircraft Electrical and Avionics Mechanics	565	43	47.8%	56.6%
7242	Industrial Electricians	3,680	42	44.4%	61.4%
7246	Telecommunications Installation and Repair	3,270	43	44.2%	64.2%
Piping					
7251	Plumbers	4,025	37	28.4%	39.9%
7252	Steamfitters, Pipefitters And Sprinkler	2,070	40	35.3%	50.7%
9510	Welders and Soldering Machine Operators	7,970	40	34.3%	48.7%
Mechanical					
7311	Millwrights And Industrial Mechanics	7,610	44	46.0%	64.7%
7312	Heavy-Duty Equipment Mechanics	6,325	42	40.8%	56.3%

Source: Census 1996

- A large number of nurses, teachers and trades workers will be retiring this decade.

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Age structure for selected health professions [38] - BC and Capital Health Region ...

	Proportion Aged 45+		Proportion Aged 55+	
	B.C.	Capital	B.C.	Capital
Registered Nurses	50.9%	56.9%	17.4%	20.5%
Licenced Practical Nurses	53.3%	57.1%	15.0%	18.5%
Physicians	52.3%	63.2%	23.4%	30.2%
Physical Therapists	44.9%	55.5%	14.5%	20.6%
Pharmacists	33.9%	43.1%	9.8%	12.7%

Source: Health Human Resources Unit, UBC -- data 1999 and 2000

- Health professionals in BC are aging, the Capital Region has an older workforce

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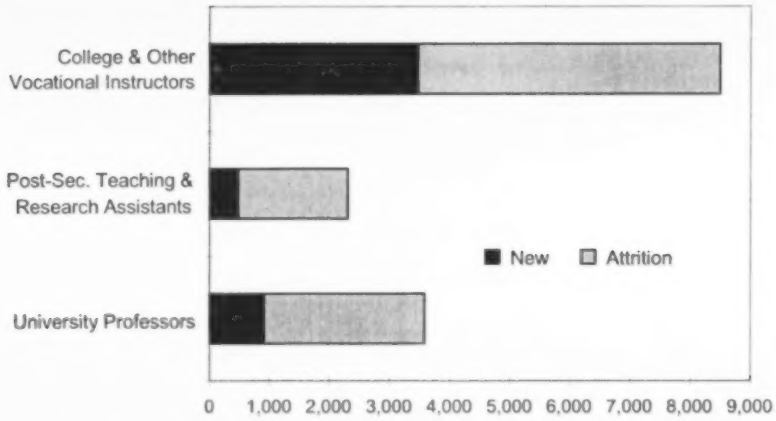
Projected BC employment openings in selected post-secondary teaching occupations, 1998-2008 ...



- Most of the British Columbia job openings in post-secondary teaching to 2008 will be due to replacement needs.

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Forward occupational projections ...

Occupational Employment Projections by Education/Training Requirement, British Columbia 1998 - 2008

Occupational Education/Training Requirement	Employment % Growth 1998-2008	Employment Distribution 1998	Employment Distribution 2008	Employment Openings Distribution 1998-2008
A - University Degree	21.3%	16.8%	17.5%	22.5%
B - Post Sec. Diploma or Certificate, including Trades Certification	17.7%	48.3%	48.7%	49.9%
C - High School Completion with On the Job Training	12.4%	18.0%	17.4%	14.1%
D - Less than High School with Short On the Job Training	13.9%	16.9%	16.5%	13.4%
Total	16.7%	100.0%	100.0%	100.0%

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Education/training "requirements" for projected BC occupational openings ...

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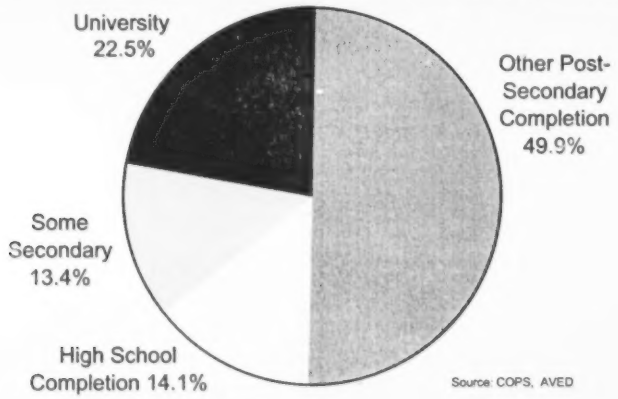
Share of Total Projected B.C. Employment Openings, 1998-2008



- Two-thirds of job openings will require more than secondary school

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Education requirements within many specific occupations is rising – examples ...

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Occupational Employment by Level of Education Completed, 1996, Canada

	Age 25-29			Age 55-59		
Occupation	No PS Diploma or Degree	College Diploma	University Degree	No PS Diploma or Degree	College Diploma	University Degree
Accountant	10%	18%	73%	43%	27%	35%
Administrative Officer	40%	29%	31%	61%	25%	14%
Systems Analyst	16%	26%	58%	41%	17%	42%
Construction Inspector	29%	52%	19%	66%	26%	8%
Recreation Supervisor	20%	21%	60%	68%	21%	11%
Graphic Designer	32%	41%	27%	63%	26%	12%
Police Officer	24%	52%	25%	73%	21%	6%

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Generating occupational projections in terms of educational requirements – challenges ...

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- Assigning single (or multiple) educational requirements to even detailed occupational groups is difficult
- Occupational titles/groups remain static
- However, how the work that is performed and tasks done within very specific occupations is changing
- New, different and higher skills are being required within many occupations
- This is raising the education and training level required within many occupations, and corresponding employer hiring demands

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Drivers of rising education/training requirements for employment ...

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- Widespread and continued growth and use of computers and information technology creates new occupations and impacts existing ones
- Workplace organization and management changes
  - New System: Flat, flexible, do many tasks, multiple responsibilities, self-manage, communications widely diffused, decision making decentralized, procedures under constant change, worker autonomy high
  - Old System: Hierarchy, rigid, do few tasks, standardized responsibilities, command & control, communications top down, decision making chain of command, standard procedures, worker autonomy low

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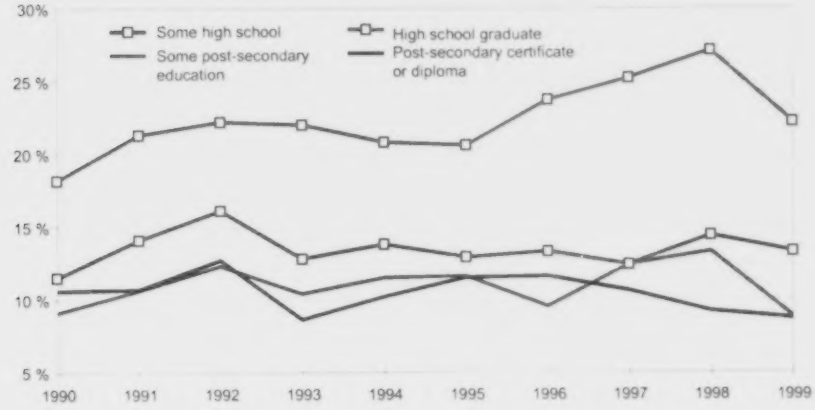
Youth with least education continue to face difficult labour market outcomes ...

B.C. Unemployment Rate for Youth Age 15-24 by Educational Attainment, 1990-1999



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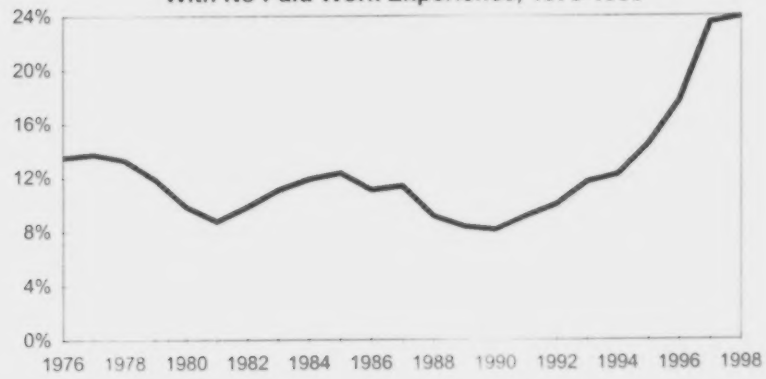
Youth job inexperience rates rising ...

Proportion of B.C. Youth Population Age 15-24 With No Paid Work Experience, 1976-1998



Source: Labour Force Survey, Statistics Canada, unpublished data

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Potential economic impacts of skilled labour shortages ...

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- Limitation of expansion of BC industries
- Increased gap between pay for highly skilled and less skilled work
- Increased job hopping by workers
- Stronger incentives to replace people with technology
- Increased use of labour in foreign countries for production
- Accelerated "brain drain" to other jurisdictions

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Types of employer responses to skills shortages - examples ...

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- More emphasis on compensation and quality work environments
- Increased pressure to change immigration policy
- Greater use of co-op programs and partnerships at post – secondary level
- Changes to retirement polices
- More investment in employee training by business to remain competitive in the local and global economies
- Promotion of technical/trades occupations where looming shortages exist

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Examples of public policies to address skilled labour shortage ...

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- Increased participation rates in post-secondary education as well as in skilled technical/trades programs requires expanding post-secondary seats
- Immigration policy, to attract immigrants with skills in demand
- Innovative programs to attract/retain highly skilled professionals in areas of "acute" scarcity.
- Expansion of tailored programs by post-secondary institutions designed to meet particular industry requirements
- Differential provincial taxation policies

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Conclusions ...

- Demographic change, ongoing shift toward more skill-intensive employment, and rising skill requirements within occupations all point to future skills shortage challenges in the coming decade
- Recruitment and retention difficulties also have a cyclical aspect, this must be acknowledged and distinguished from structural aspects
- Market-driven adjustment will "solve" part of any skills problem that is cyclical
- Key future skills shortages challenge are in health professions, IT, engineering, and some skilled technical/trades occupations
- Adequately funded, flexible and responsive PSE system is critical to providing the human capital required to maintain a competitive economy

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